INL is teaming with farmers and private industry to study the best storage practices for loose or baled corn cobs, which can be used to make biofuels.

Corn harvest kicks off massive cob storage project

By Nicole Stricker, *INL Communications & Governmental Affairs*

The 2009 corn harvest may be over, but for biomass researchers at Idaho National Laboratory, the interesting part is just beginning. Corn cobs that once had limited uses are becoming a valuable precursor to renewable fuels, and INL researchers are helping develop the logistical know-how to get cobs from fields to the biorefinery.

In partnership with the Department of Energy's Office of the Biomass Program (DOE-OBP), a consortium that includes several equipment manufacturers, farmers, ethanol producer POET and INL have worked together to establish the largest corn cob storage study of its kind. Cobs collected during this season's harvest are being stored on Iowa and South Dakota farms and studied by INL researchers to develop recommended best practices for loose cob storage, cob baling and baled cob storage.

INL's cob storage study is one of several projects focused on the logistics of getting biofuel feedstocks from fields to biorefineries.

The findings will help POET, farmers, equipment manufacturers and others in the emerging corn cob biofuels industry understand how best to harvest and store the feedstock.

"It's extremely important," said POET Biomass Program Director Mike Roth. "We've done some smaller-scale trials. But being able to involve INL, we've been able to kick it up a notch to larger-scale studies and more advanced diagnostics and research tools."

POET was one of six biorefinery companies to receive DOE-OBP funding in 2007 to commercialize production of cellulosic ethanol, which is made from plant material other than grains. In April 2009, POET and INL began designing the construction of large-scale cob piles and cob bale stacks, which are now finished and mark the first major accomplishment of this collaboration.

POET is working with a number of farmers who may be supplying cobs to one of the nation's first commercial-scale cellulosic biorefineries. The firm also is consulting with major agricultural equipment manufacturers eyeing the cob harvesting market. Better cob storage information could impact them all.

"INL has the technical and scientific resources to pull off this huge undertaking and important partnership with farmers and industry," said Kevin Kenney, who is leading INL's cob storage study.

View video of the new cob harvesting equipment.

Corn cobs are a high-moisture feedstock, so best practice guidelines are necessary to inform farmers, guide equipment innovation and harvesting practices, and improve biofuel yield. Farmers, agricultural equipment companies and end-users who are converting the cobs to fuels are all interested in methods for more cost-effectively and efficiently harvesting and supplying corn cobs for a commercial biofuel industry.

The study includes roughly 2,400 tons of loose cobs harvested from around 3,500 acres of farmland in the Emmetsburg, Iowa, area and more than 800 direct-baled large square bales harvested from about 500 acres in the Hurley, S.D., area. Kenney and his team at INL will monitor temperature, moisture and compositional degradation within varied bales and piles to identify and develop practices most conducive to feedstock stability.

This year's harvest, the first in the study, will provide the baseline data against which future findings will be compared. The current study will continue through September 2010 with a follow-up study planned for the 2010 harvest season.

Such a technically and logistically massive study would not be possible without the unique collaboration between DOE's national laboratories and private industry partners including POET, agricultural machinery manufacturers and local growers. The project illustrates the power of such

collaborations to tackle ambitious and far-reaching research projects that can provide objective information critical to nascent industries.

Participants expect these findings to impact the many harvesting practices farmers and equipment manufacturers are considering.

"The information is going to help us better understand how we should approach this type of potential market," said John Posselius, innovation engineering director with agricultural equipment manufacturer CNH America, LLC. "The type of information they're getting on how corn bales heat up, compressibility … all those things will help us determine the appropriate equipment to make available to our customers."

Links and Multimedia

Watch more videos from POET's recent cob harvesting event.
Read more about corn cob harvesting from Farm Industry News.
Learn more about INL's bioenergy research.

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